

DETERMINATION OF TOTAL PHENOLIC CONTENT OF *Portulaca grandiflora*

JANATUL NAJIHA BINTI MUSTAPAH

**Final Year Project Report Submitted in
Partial Fulfillment of the Requirement for the
Degree of Bachelor of Science (Hons.) Biology
in the Faculty of Applied Sciences
Universiti Teknologi MARA**

JULY 2017

This Final Year Project Report entitled “**Determination of Total Phenolic Content of *Portulaca grandiflora***” was submitted by Janatul Najiha binti Mustapah, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Biology, in the Faculty of Applied Sciences and was approved by

Faikah binti Awang @ Ismail
Supervisor
B. Sc. (Hons.) Biology
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah Negeri Sembilan

Lily Syahani binti Rusli
B. of Science (Hons.) Biology
Project Coordinator
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah Negeri Sembilan

Dr. Nor'aishah binti Abu Shah
B. of Science (Hons.) Biology
Head of School of Biology
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah Negeri Sembilan

Date: _____

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	viii
LIST OF EQUATIONS	ix
ABSTRACT	x
ABSTRAK	xi
 CHAPTER 1: INTRODUCTION	
1.1 Background Study	1
1.2 Problem Statement	2
1.3 Significance of the Study	3
1.4 Objectives of the Study	4
 CHAPTER 2: LITERATURE REVIEW	
2.1 <i>Portulaca grandiflora</i>	5
2.2 Secondary Metabolites	7
2.2.1 Phenols	8
2.3 Methanol	9
 CHAPTER 3: METHODOLOGY	
3.1 Materials	11
3.1.1 Raw Materials	11
3.1.2 Chemicals	11
3.1.3 Apparatus	12
3.2 Methods	12
3.2.1 Sample Preparation	12
3.2.2 Sample Extraction	13
3.2.3 Ferric Chloride Test	13
3.2.4 Total Phenolic Content (TPC) Determination	14
3.2.4.1 Preparation of Standard Gallic Acid Curve	14
3.2.4.2 Preparation of Sample	16
3.3 Statistical Analysis	16

CHAPTER 4: RESULTS AND DISCUSSION	
4.1 Ferric Chloride Test	18
4.2 Total Phenolic Content (TPC) Determination	21
4.2.1 Standard Curve of Gallic Acid	21
4.2.2 Phenolic Content of Different Parts	21
 CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS	 25
 CITED REFERENCES	 27
APPENDICES	30
CURRICULUM VITAE	35

ABSTRACT

DETERMINATION OF TOTAL PHENOLIC CONTENT OF *Portulaca grandiflora*

Portulaca grandiflora is a herbaceous succulent plant that grows widely in many parts of the world especially in temperate climate regions. It is generally planted commercially as an ornament due to its variety of flower colours such as yellow, red, orange and white. However, its other importance is not extensively discovered. Thus the study aimed to determine and compare the phenolic composition of the different parts of the plant that are leaf, stem and root and therefore could help widen the importance of *P. grandiflora*. The study was divided into two parts; qualitative and quantitative. Ferric chloride test was done for qualitative phenolic screening while Folin-Ciocalteu test was done for quantitative phenolic determination. Gallic acid was used for standard curve preparation. The results of former test indicated that leaves and stems extracts showed positive reaction towards aqueous iron (III) chloride through the change of colours from green into greenish black. Root extract indeed reacted positively from brown to greenish black. Other than that, through Folin-Ciocalteu method, it is known that among the three extracts, leaves extract contain the highest phenolic content that is 85.9222 ± 0.0192 . This is followed by stems with 21.9347 ± 0.0300 and roots with 10.1927 ± 0.0081 . Further analysis then proved that there were significant difference between leaves and stems, leaves and roots as well as stems and roots. Thus, it is concluded that different parts of *Portulaca grandiflora* contain secondary metabolites that is phenolic compound with the highest concentration found in leaves.